

Name: _____

Date: _____

A2CC Review Q3 Exam 1

This review is not comprehensive. Be sure to review your notes, homework assignments, and old tests as well.

1. The quadratic function $f(x)$ has a turning point at $(5, -8)$. If $g(x) = f(x+7) - 3$, then at which of the following does $g(x)$ have a turning point?

(1) $(-2, -11)$ (3) $(-7, -3)$

(2) $(12, -11)$ (4) $(12, -5)$

2. Where does the absolute value function $y = \frac{1}{2}|x-8| + 3$ have a turning point?

(1) $(-4, 3)$ (3) $(8, 3)$

(2) $(4, -3)$ (4) $(8, -3)$

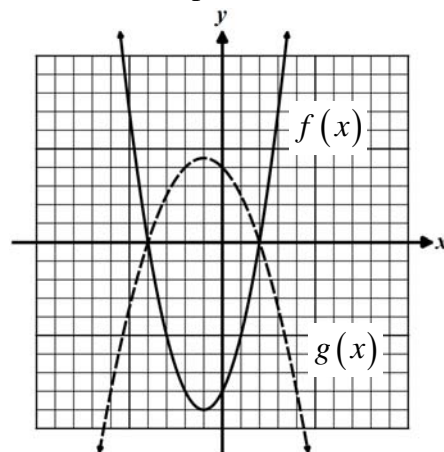
3. The function $f(x)$ is shown below graphed in solid while the function $g(x)$ is shown dashed. Which of the following equations describes the relationship between the two functions?

(1) $g(x) = f(x) - 6$

(2) $g(x) = -\frac{1}{2}f(x)$

(3) $g(x) = 2f(x)$

(4) $g(x) = f\left(\frac{1}{2}x\right)$



4. Given that the function $y = x^2 + 6x - 27$ has x -intercepts at $x = -9$ and $x = 3$, where does the function $y = (3x)^2 + 6(3x) - 27$ have x -intercepts?

(1) $x = \pm 6$ (3) $x = -27$ and $x = 9$

(2) $x = -12$ and $x = 0$ (4) $x = -3$ and $x = 1$

5. If the point $(-3, 7)$ lies on the graph of $f(x)$, then which of the following points must lie on the graph of $y = 5f(x) - 20$?

(1) $(-15, -13)$ (3) $(2, -13)$

(2) $(-3, 15)$ (4) $(1, 25)$

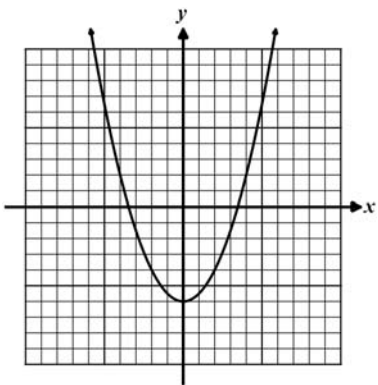
6. The range of the function $f(x)$ is $-4 \leq y \leq 10$. If $g(x) = -f(x) + 3$ then which of the following is the range for $g(x)$?

(1) $-7 \leq y \leq 7$ (3) $-13 \leq y \leq 1$

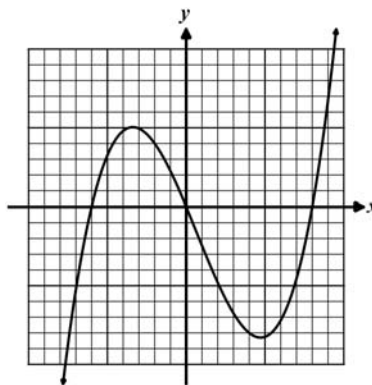
(2) $5 \leq y \leq 15$ (4) $-3 \leq y \leq 8$

7. Which graph below shows an even function?

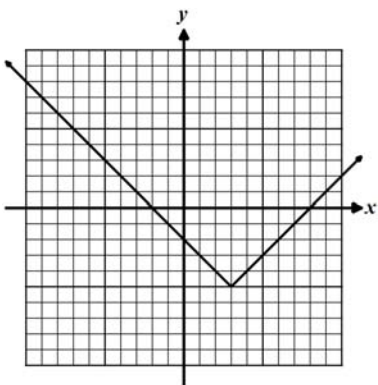
(1)



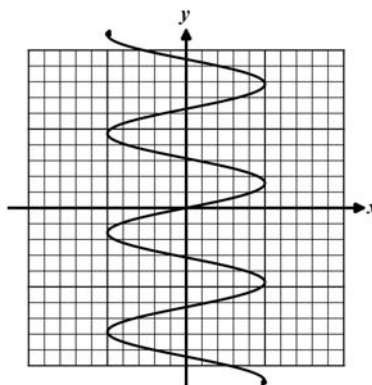
(3)



(2)



(4)



8. If $f(x)$ is an odd, one-to-one function with $f(5) = -2$ then which point *must* lie on the graph of its inverse, $f^{-1}(x)$?

(1) $(5, -2)$ (3) $(-5, 2)$

(2) $(2, -5)$ (4) $(2, 5)$

9. The parabola $y = 3x^2 - 24x + 55$ can be written in the form

(1) $y = 3(x - 2)^2 + 2$ (3) $y = 3(x + 2)^2 - 11$

(2) $y = 3(x - 8)^2 + 55$ (4) $y = 3(x - 4)^2 + 7$

Free Response

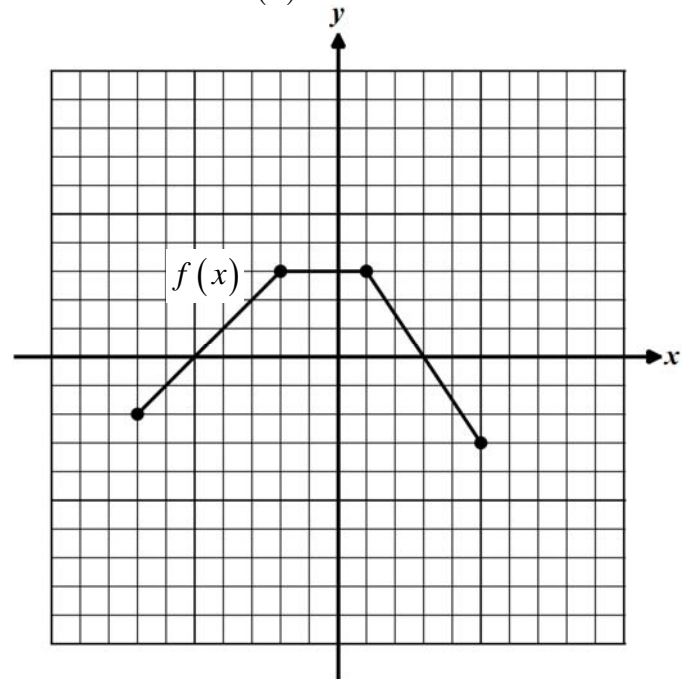
10. For the function $f(x)$ it is known that $(-12, 4)$ lies on the function. A second function, $g(x)$, is defined by the formula $g(x) = f(2x) - 3$.

Describe the transformations that occur to the graph of f in order to produce the graph of g .

Based on the fact that the point $(-12, 4)$ lies on $f(x)$, what point must lie on $g(x)$?

11. The graph of the function $f(x)$ is shown below. The function $g(x)$ is defined by the formula $g(x) = -2f(x)$ for all values of x .

Produce the graph of g on the same grid.

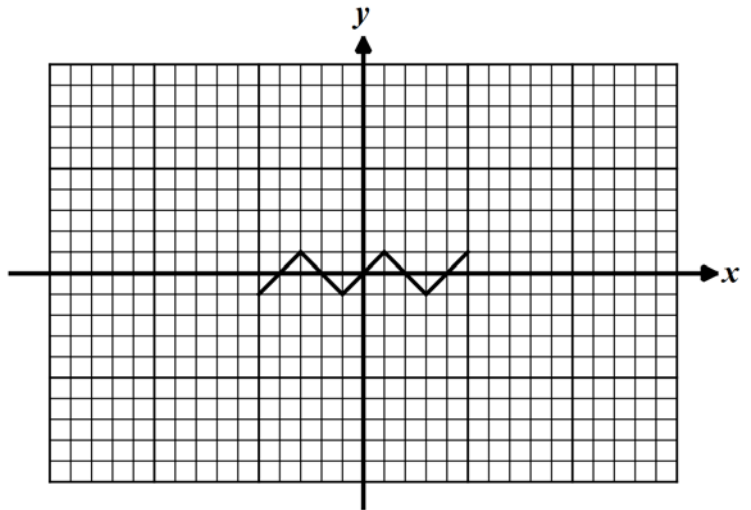


Solve the equation $f(x) = g(x)$ for all values of x .

12. The function $f(x) = \frac{x^4 - 8}{4x}$ is either an even function or an odd function. Provide evidence to support your answer.

13. The graph of $f(x)$ is shown below. The function $g(x)$ is defined by $g(x) = 5f\left(\frac{x}{2}\right)$.

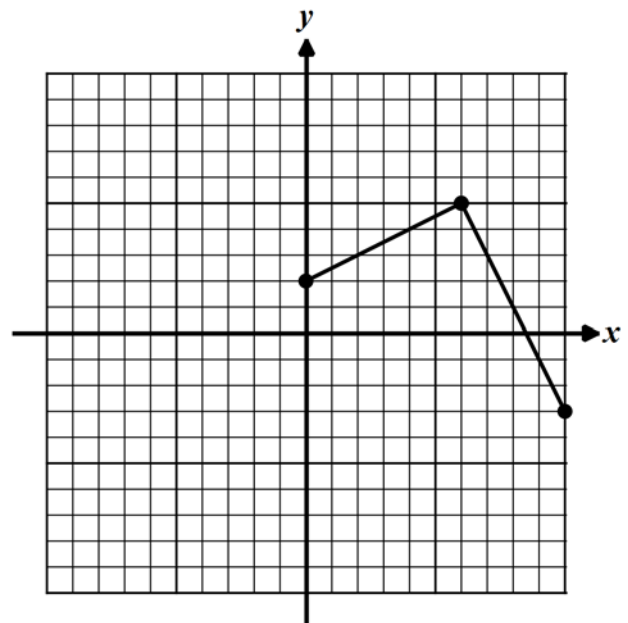
Explain the transformations that will transform the graph of $f(x)$ into the graph of $g(x)$ and then produce it on the same grid.



14. The function below shows the portion of the even function $f(x)$ for $x \geq 0$.

Sketch the portion of $f(x)$ for $x < 0$.

What value(s) of x solve the equation $f(x) = 1$?



Does this function have an inverse that is also a function? Why or why not?

15. Given the parabola $f(x) = -(x-8)^2 + 5$, describe three transformations which would transform the graph of $y = x^2$ into the graph of $f(x)$. Give both the transformations and the order.

16. Describe the difference between the transformations $f(-x)$ and $-f(x)$ on the graph of $f(x)$.

17. A function $g(x)$ has a domain of $-5 \leq x \leq 10$ and a range of $y \leq 15$. If a new function is defined by $y = 5g(-x) + 3$, then what are its domain and range? Explain how you found your answer.

18. Place the following quadratic function in $y = a(x-h)^2 + k$. Identify the coordinates of its turning point.

$$y = 3x^2 - 12x + 23$$

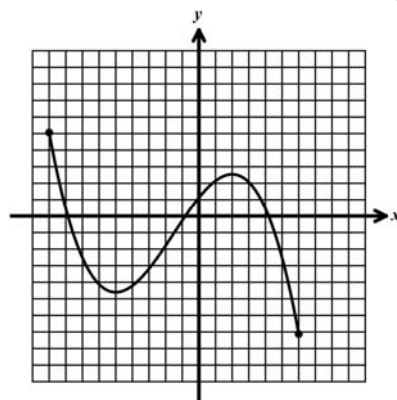
19. Given the function shown below, over which of the following intervals is the function always increasing?

(1) $0 < x < 5$

(2) $-5 < x < 2$

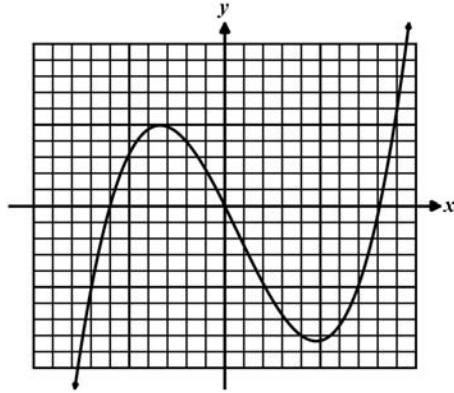
(3) $-1 < x < 4$

(4) $-9 < x < -5$



20. Given the graph of the function shown below, what is its maximum value of the interval $-5 \leq x \leq 9$?

- (1) 5
- (2) 6
- (3) 3
- (4) 10



21. Simplify the following (Be sure to indicate restrictions):

$$\frac{1 + 5x^{-1} - 14x^{-2}}{x - 4x^{-1}}$$

22. Solve and express your solution on a number line and in set builder notation:

$$\frac{2x-4}{x+5} \geq 0$$

23. Solve algebraically for x: $\frac{x}{2x+8} + \frac{2}{2x-8} = \frac{16}{x^2-16}$

24. Simplify the following and indicate all restrictions:

$$\frac{2x^2 + 5x + 2}{x^2 - 4} \cdot \frac{x^2 - 5x + 6}{4x + 2} \div \frac{2x^2 - 4x - 6}{4x^2 + 8x + 4}$$